DRAFT ENGINEERING EVALUATION
Haley & Aldrich
Plant: 24247
Application: 29526

BACKGROUND

Haley & Aldrich has applied to obtain an Authority to Construct for the following equipment:

S-1 Sub-slab Depressurization System
40 cfm maximum capacity

The source is located at 123 Marina Blvd, San Francisco, CA 94123. Haley & Aldrich is installing the sub-slab depressurization system beneath a property for vapor intrusion mitigation. The system will remove the air pollutants from beneath the home and direct it an exhaust point 12 feet above the roof line. Based on a review of the air samples, the primary constituents of emissions from the sub-slab depressurization system are precursor organic compounds (POC) and non-precursor organic compounds (NPOC).

EMISSION CALCULATIONS

Criteria Pollutants

For a conservative estimate, the system is assumed to be operating 24 hours a day and 365 days a year. The inlet concentration for the system are based on the highest concentration detected in the air samples collected by Haley & Aldrich. The following is a summary of the values used for the emission calculations.

Pollutant	Inlet Concentration (lb/ft^3)
POC	
Benzene	1.87E-11
Carbon Disulfide	2.94E-10
Chloroform	5.06E-10
Ethyl Benzene	6.19E-12
Methyl Ethyl Ketone	1.50E-10
Naphthalene	2.81E-11
Toluene	9.37E-11
Xylene	3.00E-11
Total POC	**1.13E-09**
NPOC	
Acetone	8.75E-10
Total NPOC	**8.75E-10**

Based on the manufacturer's specifications, the maximum flow rate from the blower is 40 cfm.

Maximum Daily Emissions

$$Daily\ POC\ Emissions\ = \left(1.13E-09\frac{lb}{ft^3}\right)\times\left(40\frac{ft^3}{min}\right)\times\left(60\frac{min}{hr}\right)\times\left(24\frac{hr}{day}\right) = 6.49E-05\ lb/day$$

$$Daily\ NPOC\ Emissions\ = \left(8.75E-10\frac{lb}{ft^3}\right)\times\left(40\frac{ft^3}{min}\right)\times\left(60\frac{min}{hr}\right)\times\left(24\frac{hr}{day}\right) = 5.04E-05\ lb/day$$

To allow the facility some flexibility, the maximum daily emissions will be limited to 0.006 pound of POC per day and 0.006 pound of NPOC per day.

Annual Emissions

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$$Annual\ POC\ Emissions\ = \left(0.006\frac{lb}{day}\right) \times \left(365\frac{days}{year}\right) = 2.2\ lb/yr$$

$$Annual\ NPOC\ Emissions\ = \left(0.006\frac{lb}{day}\right) \times \left(365\frac{days}{year}\right) = 2.2\ lb/yr$$

The following table summarizes the maximum daily and annual criteria pollutants:

Pollutant	Maximum Daily Emissions (lb/day)	Maximum Annual Emissions (lb/yr)	Maximum Annual Emissions (tpy)
POC	0.006	2.2	0.001
NPOC	0.006	2.2	0.001

Toxic Pollutants

The following pollutants are listed as a toxic air contaminant listed in Table 2-5-1 of Regulation 2-5. For a conservative estimate, the maximum concentration for each toxic air contaminant is asumed to equal to 100% of maximum permitted daily emission rate of 0.006 lb/day for each pollutant. Emission calculations assume the maximum flow rate of 40 cfm, operating 24 hours/day, 365 days/year. Based on emissions data provided by Haley & Aldrich, the pollutant with the highest concentration in the exhaust, chloroform, makes up less than 50% of the exhaust stream, so actual emissions for each pollutant are lower than the emissions presented in the table below.

Pollutant	Hourly Emissions (lb/hr)	Acute Trigger (lb/hr)	Acute HRA Triggered?	Annual Emissions (lb/yr)	Chronic Trigger (lb/yr)	Chronic HRA Triggered?
benzene	2.7E-04	6.00E-02	NO	2.2	2.90E+00	NO
carbon disulfide	2.7E-04	1.40E+01	NO	2.2	3.10E+04	NO
chloroform	2.7E-04	3.30E-01	NO	2.2	1.50E+01	NO
ethylbenzene	2.7E-04	n/a	NO	2.2	3.30E+01	NO
methyl ethyl ketone	2.7E-04	2.90E+01	NO	2.2	n/a	NO
naphthalene	2.7E-04	n/a	NO	2.2	2.40E+00	NO
toluene	2.7E-04	8.20E+01	NO	2.2	1.20E+04	NO
xylene (mixed isomers)	2.7E-04	4.90E+01	NO	2.2	2.70E+04	NO

Emissions of toxic pollutants will not exceed the acute or chronic trigger levels in Regulation 2-5.

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Cumulative Increase

The table below summarizes the cummlative increase in criteria pollutants that will result from the operation of S-1:

Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Permitted Emissions, Post 4/5/91 (TPY)		Project Cumulative Emissions Increase (TPY)		Plant Permitted Cumulative Emissions Increase (TPY)
NO_x	0.000	+	0.000	=	0.000
POC	0.000	+	0.001	=	0.001
CO	0.000	+	0.000	=	0.000
PM_{10}	0.000	+	0.000	=	0.000
$PM_{2.5}$	0.000	+	0.000	=	0.000
SO_2	0.000	+	0.000	=	0.000
NPOC	0.000	+	0.001		0.001

STATEMENT OF COMPLIANCE:

Regulation 2 - Permits, Rule 1 – General Requirements

Ministerial Projects (Section 2-1-311)

An application that is classified as ministerial is exempt from the CEQA requirement of *Section 2-1-310 Applicability of CEQA.* Section 9.2 of the District's Permit Handbook, which sets forth evaluation guidelines for Soil Vapor Extraction, was used to evaluate this project. As such, this application is classified as ministerial and this project is exempt from CEQA review with respect to air quality.

Public Notice, Schools (Section 2-1-412)

A new of modified source located within 1,000 feet of the outer boundary of a K-12 school site which results in an increase of emissions from toxic air contaminants is subject to the public notice requirement. The outer boundary of the nearest K-12 school, AltSchool Fort Mason, is 205 feet from the location of this project. Marina Middle School is 800 feet from the location of this project. This project is subject to the public notification requirements of *Regulation 2-1-412*. Notification of the proposed new source must be mailed to the parents or guardians of all children enrolled in any school within on-quarter mile of the source, and to each address within a radius of 1,000 feet of the source, in order to give these parties an opportunity to provide public comments on the proposed actions. All comments received within 30 days of the publication of this notice will be reviewed and considered in the final evaluation and approval or denial of the application.

Regulation 2 - Permits, Rule 2 – New Source Review

Best Available Control Technology Requirement (Section 2-2-301)

Any new source is required to use Best Available Control Technology (BACT) to control emissions of any District BACT pollutants [precursor organic compounds (POC), non-precursor organic compounds (NPOC), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and/or carbon monoxide (CO)] that have the potential to emit 10 or more pounds on any day. The sub-slab depressurization system will be permitted to emit 0.006 lb of POC per day and 0.006 lb of NPOC per day. This project is not subject to this regulation.

Offset Requirements, POC and NO_x (Section 2-2-302)

This section establishes emission offset requirements for POC and NO_x at facilities that will have the potential to emit more than 10 tons per year of POC or NO_x. If the facility will have the potential to emit more than 10 tons per year but less than 35 tons per year of NO_x or POC after the new or modified source is constructed, offsets must be provided at a 1:1 ratio for any un-offset cumulative increase in emissions at the facility. These offsets shall be provided by the District's Small Facility Banking Account unless the applicant owns offsets. The cumulative POC emissions at the facility is 0.001 tons per year. Since POC emissions will be less than 10 tons per year, offsets are not required.

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Regulation 2- Permits, Rule 5 New Source Review of Toxic Air Contaminants

General (2-5-100)

Any new or modified source of toxic air contaminant (TAC) shall be evaluated for potential public exposure and health risk. Regulation 2-5-110 Exemption, Low Emission Levels provides an exemption if, for each toxic air contaminant, the increase in emissions from the project is below the trigger level listed in Table 2-5-1 of Regulation 2-5. All toxic air contaminants from the planned operation of this source are summarized in the toxic emissions summary above which show emissions of toxic air contaminants listed in Regulation 2-5 are below their respective trigger levels. This facility is not subject to this requirement.

Regulation 8 – Organic Compounds, Rule 47 – Air Stripping and Soil Vapor Extraction Operations

Exemption, Air Stripping and Soil Vapor Extraction Operations Less than 1 Pound Per Day (Section 8-47-113)

The facility will emit less than 1 pound per day of benzene, vinyl chloride perchloroethylene, methylene chloride, and trichloroethylene. Permit conditions will be included to limit emissions to 0.006 lb/day. The facility is exempt from the requirements in Section 8-47-301.

Less Than 1 Pound Per Day Petition (Section 8-47-402)

To satisfy the requirement of Section 8-47-113, the facility will need to submit an annual petition to confirm emissions for benzene, vinyl chloride perchloroethylene, methylene chloride, and trichloroethylene are less than 1 pound per day. Permit conditions will be included to meet this standard.

Federal Requirements

S-1 is not be subject to any subpart of 40 CFR 60 for NSPS or 40 CFR 63 for NESHAP.

CONDITIONS

I recommend the following permit conditions for S-1:

COND# 26924 ----------

S-1 Sub-Slab Depressurization System

1. The owner/operator of S-1 shall not exceed 0.006 pounds of POC during any calendar day.
   [Basis: Cumulative Increase, Regulation 2-5, Regulation 8-47]

2. The owner/operator of S-1 shall not exceed 0.006 pounds of NPOC during any calendar day.
   [Basis: Cumulative Increase]

3. The owner/operator of S-1 shall monitor with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test manager at the outlet of S-1. When using an FID to monitor, readings may be taken with and without a Carbon Filter tip fitted on the PID probe. Concentrations measure with the Carbon filter tip in place shall be considered methane for the purpose of these permit conditions. The owner/operator of S-1 shall conduct this monitoring on a quarterly basis.
   [Basis: Cumulative Increase, Regulation 2-5]

4. The owner/operator of S-1 shall record these monitor readings in a monitoring log at the time they are taken. The owner/operator shall use the monitoring results to estimate the emissions on a quarterly basis. The owner/operator of S-1 may propose for a District review, based on actual measurements taken at the site during operations of the source, that monitoring schedule be changed based on the decline in organic emissions. Written approval by the District's Engineering Division shall be received by the owner/operator prior to a change to the monitoring schedule.
   [Basis: Cumulative Increase

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5. The owner/operator of S-1 shall maintain the following information for each month of operation:
    a. Hours and time of operation
    b. Total throughput of vapor from source S-1 in Standard Cubic Feet.
    c. Each emission test, analysis or monitoring results logged for the day of operation they were taken.

    The owner/ operator of S-1 shall retain and make available for inspection by the District such records for two years following the date the data is recorded.
    [Basis: Regulation 1-523]

6. The owner/operator of S-1 shall report any non-compliance with these conditions to the Compliance and Enforcement Division at the time that it is first discovered. The owner/operator of S-1 shall detail the corrective action taken and include the data showing the exceedance as well as the time of occurrence in the submittal.
    [Basis: Cumulative Increase, Regulation 2.5]

7. The owner/operator of S-1 shall maintain a file containing all measurements, records, and other data that are required to be collected pursuant to the various provisions of this conditional Authority to Construct/Permit to Operate. All measurements, records and data required to be maintained by the owner/operator shall be retained for at least two years following the date the data is recorded.
    [Basis: Regulation 1-523]

8. Upon final completion of the project, the owner/operator of S-1 shall notify the Engineering Division within two weeks of decommissioning the operation.
    [Basis: Cumulative Increase, Regulation 2-5]

RECOMMENDATIONS:

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct/Permit to Operate for the following source:

S-1 Sub-slab Depressurization System
40 cfm maximum capacity

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Loi Chau, Air Quality Engineer Date

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